SCOPE OF CLAIMS

1. A photodiode array comprising a semiconductor substrate,

wherein a plurality of photodiodes are formed in array on an opposite surface side to an incident surface of light to be detected, in the semiconductor substrate, and

wherein a depression with a predetermined depth more depressed than a region not corresponding to regions where the photodiodes are formed, is formed in regions corresponding to the regions where the photodiodes are formed, on a side of the incident surface of the light to be detected, in the semiconductor substrate.

2. The photodiode array according to Claim 1, wherein the depression comprises a plurality of depressions, and

wherein adjacent depressions are in communication with each other.

3. The photodiode array according to Claim 1, wherein the depression comprises a plurality of depressions formed corresponding to the respective photodiodes, and

wherein adjacent depressions are in communication with each other.

4. The photodiode array according to any one of Claims 1 to 3, wherein the semiconductor substrate is provided with an impurity region between the photodiodes adjacent to each other, for separating the photodiodes from each other.

5. The photodiode array according to any one of Claims 1 to 4, wherein a high-impurity-concentration layer of the same conductivity type as the semiconductor substrate is formed on the incident surface

side of the light to be detected, in the semiconductor substrate.

6. The photodiode array according to any one of Claims 1 to 5, wherein a plurality of depressions having a predetermined depth are formed in array on the opposite surface side to the incident surface of the light to be detected, in the semiconductor substrate, and

wherein each said photodiode is formed in a bottom portion of the associated depression.

7. A method of producing a photodiode array, the method comprising:

a step of preparing a semiconductor substrate comprised of a semiconductor of a first conductivity type;

a step of forming a plurality of impurity diffused layers of a second conductivity type on one surface side of the semiconductor substrate to form a plurality of photodiodes each comprised of the impurity diffused layer and the semiconductor substrate, in array; and

a step of forming a depression with a predetermined depth more depressed than a region not corresponding to regions where the photodiodes are formed, in regions corresponding to the regions where the photodiodes are formed, on another surface of the semiconductor substrate.

8. The method according to Claim 7, further comprising a step of forming a high-impurity-concentration layer of the first conductivity type on the other surface of the semiconductor substrate, after the step of forming the depression.

9. A method of producing a photodiode array, the method comprising:

a step of preparing a semiconductor substrate comprised of a semiconductor of a first conductivity type;

a step of forming a plurality of first depressions in array on one surface side of the semiconductor substrate;

a step of forming a plurality of impurity diffused layers of a second conductivity type in bottom portions of the first depressions to form a plurality of photodiodes each comprised of the impurity diffused layer and the semiconductor substrate, in array; and

a step of forming a second depression with a predetermined depth more depressed than a region not corresponding to regions where the photodiodes are formed, in regions corresponding to the regions where the photodiodes are formed, on another surface of the semiconductor substrate.

10. The method according to Claim 9, further comprising a step of forming a high-impurity-concentration layer of the first conductivity type on the other surface of the semiconductor substrate, after the step of forming the second depression.

11. The method according to any one of Claims 7 to 10, further comprising a step of providing an impurity region of the first conductivity type between the impurity diffused layers adjacent to each other.

12. A radiation detector comprising:

the photodiode array as set forth in any one of Claims 1 to 6; and

a scintillator panel arranged opposite to the incident surface of the light to be detected in the photodiode array, and arranged to emit

light with incidence of radiation.

13. A radiation detector comprising:

the photodiode array produced by the method as set forth in Claim 7 or 8; and

a scintillator panel arranged opposite to the surface where the depression is formed in the photodiode array, and arranged to emit light with incidence of radiation.

14. A radiation detector comprising:

the photodiode array produced by the method as set forth in Claim 9 or 10; and

a scintillator panel arranged opposite to the surface where the second depression is formed in the photodiode array, and arranged to emit light with incidence of radiation.